

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1 (currently amended): A cylindrical roller bearing comprising:
an inner ring having an inner ring raceway surface;
an outer ring having an outer ring raceway surface; and
pluralities of cylindrical rollers each disposed between the inner ring raceway surface and the outer ring raceway surface,

wherein at least one of the inner ring and the outer ring has a flange portion provided with a roller guide-surface which contacts with and guides end faces of the cylindrical rollers,

~~supposing that a diameter of the cylindrical roller is D_a , the end face of the cylindrical roller away from a center axis of the cylindrical roller by $0.40D_a$ in a radial direction is set as a first position, and the end face of the cylindrical roller away from the center axis of the cylindrical roller by $0.35D_a$ in the radial direction is set as a second position, wherein the end face of the cylindrical roller contacts with the roller guide-surface of the flange portion between the a first position and the a second position, the first position corresponding to a position of the end face of the cylindrical roller away from a center axis of the cylindrical roller by a distance $0.40 \times D_a$ where D_a is a diameter of the cylindrical roller, and the second position corresponding to a position of the end face of the cylindrical roller away from the center axis of the cylindrical roller by a distance $0.35 \times D_a$~~

wherein the end face of the cylindrical roller has a convex-shaped crowning portion formed by a continuous curve which passes the first position and the second position, and

wherein an angle α formed between a straight line connecting the first position and the second position and a straight line perpendicular to the center axis of the cylindrical roller is set to be 0.5° or less.

Claim 2 (original): The cylindrical roller bearing according to claim 1, characterized in that the angle α satisfies a relation of $\alpha < \theta$ with respect to an open angle θ of the roller guide-surface, and a surface roughness of at least the crowning portion at the end face of the cylindrical roller is set in a range of 0.02 to 0.15 μmRa .

Claim 3 (previously presented): A cylindrical roller bearing comprising: an inner ring having an inner ring raceway surface; an outer ring having an outer ring raceway surface; and pluralities of cylindrical rollers each disposed between the inner ring raceway surface and the outer ring raceway surface, wherein at least one of the inner ring and the outer ring has a flange portion provided with a roller guide-surface which contacts with and guides end faces of the cylindrical rollers,

the end face of the cylindrical roller has a convex-shaped crowning portion which contacts with the roller guide-surface when a load of a predetermined value or more acts, and

a radial direction distance h between the rolling surface of the cylindrical roller and a cross point where the end face of the cylindrical roller contacts with a phantom line along the roller guide-surface in a state where no load acts satisfies a relation of $h = Da / 2 - R' \times \sin(\theta)$ and $0.05 \text{ (mm)} \leq h \leq 0.5 \text{ (mm)}$, wherein Da represents a diameter of the cylindrical roller, θ

represents a flange open angle of the roller guide-surface, and R' represents a curvature radius of the crowning portion.

Claim 4 (original): The cylindrical roller bearing according to claim 3, characterized in that the a ratio between the radial direction distance h and a flange height L of the flange portion satisfies a relation of $0.01 \leq h/L \leq 0.13$, and the cross point faces on a relief groove formed in at least one of the inner ring raceway surface and the outer ring raceway surface.

Claim 5 (new): The cylindrical roller bearing according to claim 1, wherein a chamfer portion is formed at a region next to a radial outer surface of the cylindrical roller.

Claim 6 (new): The cylindrical roller bearing according to claim 1, wherein the end surface of the cylindrical roller comprises:

the crowning portion;

a chamfer portion located between the crowning portion and a radial outer surface of the cylindrical roller; and

a flat portion located at inside diameter side relative to the crowing portion.

Claim 7 (new): The cylindrical roller bearing according to claim 3, wherein a chamfer portion is formed at a region next to a radial outer surface of the cylindrical roller.

Claim 8 (new): The cylindrical roller bearing according to claim 3, wherein the end surface of the cylindrical roller comprises:

the crowning portion;

a chamfer portion located between the crowning portion and a radial outer surface of the cylindrical roller; and

a flat portion located at inside diameter side relative to the crowing portion.